AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application:

Claim 1 (currently amended): A method for controlling an attitude of a vehicle in a space having at least two opposed viewable regions about said vehicle, each region being viewed by a respective first sensor ~~for sensing~~ which senses radiation in a first frequency band of electromagnetic radiation and a respective second sensor ~~for sensing~~ which senses radiation in a second different frequency band of electromagnetic radiation, said method including the steps of:

a) producing a first data set from said first sensor viewing a first of said regions;

b) producing a second data set from said second sensor viewing said first region;

c) modifying said second data set;

d) combining the result of said modifying step with said first data set to form a third data set for said first region;

e) repeating steps a) to d) for a second set of first and second sensors viewing an opposed viewable region; and

f) adjusting the attitude of said vehicle until respective said third data sets for each opposed viewable region are substantially equal.

Claim 2 (previously presented): A method for controlling an attitude of a vehicle as claimed in claim 1, wherein said steps of modifying and combining reduce a bias introduced by a source of electromagnetic radiation in a viewable region.

Claim 3 (original): A method for controlling an attitude of a vehicle as claimed in claim 2, wherein measurements by each of said second sensors in said second frequency band are substantially sensitive to said electromagnetic source and relatively insensitive to intensity differences between the sky and ground in said second frequency band.

Claim 4 (currently amended): A method as claimed in claim 1, wherein said step of modifying includes multiplying said second data set by a predetermined factor [[K]].

Claim 5 (previously presented): A method for controlling an attitude of a vehicle as claimed in claim 1, wherein said step of combining includes subtracting said result of said modifying step from said first data set.

Claim 6 (previously presented): A method for controlling the attitude of a vehicle as claimed in claim 1, wherein said steps of producing first and second data sets further each includes the step of logarithmically compressing said data sets.

Claim 7 (original): A method for controlling the attitude of a vehicle as claimed in claim 2, wherein said sensors are imaging sensors and said data sets produced from said sensors correspond to measurements made for each pixel of each of said imaging sensors, said imaging sensors furthermore adjusted to be substantially saturated by said electromagnetic source, wherein said step of modifying includes determining a subset of said first data set corresponding to said saturated pixels in said first data set from said first sensor and said step of subtracting includes removing an equivalent subset of data from the second data set data from said second sensor to form said third data set.

Claim 8 (previously presented): A method for controlling an attitude of a vehicle as claimed in claim 1 further including the steps of:

g) calculating an anti-correlation value for each of said respective third data sets, and

h) reducing the adjusting if said anti-correlation value is low.

Claim 9 (original): A method for controlling an attitude of a vehicle as claimed in claim 8, wherein said anti-correlation value is calculated by determining the complement of a Hassenstien-Reichardt correlation detector.

Claim 10 (previously presented): A method for controlling an attitude of a vehicle as claimed in claim 1, wherein said first frequency band of electromagnetic radiation is in the ultraviolet frequencies and said second frequency band is in the green spectra frequencies and a source of the electromagnetic radiation is the sun.

Claim 11 (previously presented): A method for controlling an attitude of a vehicle as claimed in claim 1, wherein at least of one said first and second frequency bands corresponds to the mm wavelength band.

Claim 12 (previously presented): A method for controlling an attitude of a vehicle as claimed in claim 1, wherein said opposed viewable regions are to the left and right of said vehicle and the attitude of the vehicle which is controlled is roll.

Claim 13 (previously presented): A method for controlling an attitude of a vehicle as claimed in claim 1, wherein said opposed viewable regions are fore and aft of said vehicle and the attitude of the vehicle which is controlled is pitch.

Claim 14 (previously presented): A method for controlling an attitude of a vehicle as claimed in claim 1, wherein said opposed viewable regions are to the left and right of said vehicle and to the fore and aft of said vehicle respectively and both vehicle roll and pitch are controlled.

Claim 15 (previously presented): A method for controlling an attitude of a vehicle as claimed in claim 14, wherein said first and second data sets corresponding to the aft viewable region are generated by modifying and combining respective first and second data sets from said left and right viewable regions thereby eliminating the requirement for sensors viewing said aft region.

Claim 16 (previously presented): A vehicle whose attitude is being controlled according to the method of claim 1.

Claim 17 (currently amended): A method for calculating the attitude of a vehicle in a space having a viewable region, said region being viewed by a first and second pair of sensors, each of said first and second pairs including a first sensor ~~for sensing~~ which senses radiation in a first frequency band of electromagnetic radiation and a second sensor ~~for sensing~~ which senses radiation in a second different frequency band of electromagnetic radiation, said first pair of sensors being tilted a first predetermined angle to view a first sub-region substantially above and including a horizon between the ground and sky, and said second pair of sensors being tilted a second

predetermined angle to view a second sub-region substantially below and including the horizon; the method including the steps of :

a) producing a first data set from said first sensor of said first pair;

b) producing a second data set from said second sensor of said first pair;

c) modifying said second data set;

d) combining the result of said modifying step with said first data set to form a third data set for said first pair;

e) repeating steps a) to d) for said first and second sensors of said second pair;

f) determining a relationship between a change in intensity between said third data sets and said vehicle attitude; and

g) calculating said vehicle attitude from said relationship.

Claim 18 (original): A method for calculating the attitude of a vehicle as claimed in claim 17, wherein said step of determining includes calculating an angular difference between said first and second predetermined angles.

Claim 19 (previously presented): A method for calculating the attitude of a vehicle as claimed in claim 17, further including the step of calculating the rate of change of vehicle attitude.

Claim 20 (previously presented): A method for calculating the attitude of a vehicle as claimed in claim 17, wherein said steps of modifying and combining reduce an intensity bias introduced by a source of the electromagnetic radiation in said viewable region.

Claim 21 (original): A method for calculating the attitude of a vehicle as claimed in claim 20, wherein measurements by each of said second sensors of each pair in said second frequency band are substantially sensitive to said electromagnetic source and relatively insensitive to intensity differences between the sky and ground in said second frequency band.

Claim 22 (original): A method for calculating the attitude of a vehicle as claimed in claim 21, wherein the first band of electromagnetic radiation is in the ultraviolet frequencies and the

second band is in the green spectra frequencies and the source of electromagnetic radiation is the sun.

Claim 23 (original): A method for calculating the attitude of a vehicle as claimed in claim 21, wherein at least of one said first and second frequency bands is in the mm band of frequencies.

Claim 24 (previously presented): A method for calculating the attitude of a vehicle as claimed in claim 17, wherein said viewable region is to the left or right of said vehicle and said vehicle roll is determined.

Claim 25 (previously presented): A method for calculating the attitude of a vehicle as claimed in claim 17, wherein said viewable region is to the fore or aft of said vehicle and said vehicle pitch is determined.

Claim 26 (withdrawn): A method for reducing the effects of a source of electromagnetic radiation when viewing a region to detect variations in background intensity in said region, said method including the steps of:

a) producing a first data set from a first sensor viewing said region in a first frequency band;

b) producing a second data set from a second sensor viewing said region in said second frequency band;

c) modifying said second data set; and

d) combining the result of said modifying step with said first data set to form a third data set for said region, said third data set containing data wherein said effects of said electromagnetic source are substantially reduced relative to said variations in background intensity.

Claim 27 (withdrawn): A method for reducing the effects of a source of electromagnetic radiation as claimed in claim 26, wherein measurements by said second sensor in said second frequency band is substantially sensitive to said electromagnetic source and relatively insensitive to intensity differences between variations in background intensity in said second frequency band.

Claim 28 (withdrawn): A method for reducing the effects of a source of electromagnetic radiation as claimed in any one of claims 26 or 27, wherein said step of modifying includes multiplying said second data set by a predetermined factor K.

Claim 29 (withdrawn): A method for reducing the effects of a source of electromagnetic radiation as claimed in any one of claims 26 to 28, wherein said step of combining includes subtracting said result from said modifying step from said first data set.

Claim 30 (withdrawn): A method for reducing the effects of a source of electromagnetic radiation as claimed in any one of claims 26 to 29, wherein said steps of producing first and second data set further includes the step of logarithmically compressing said data sets.

Claim 31 (withdrawn): A method for reducing the effects of a source of electromagnetic radiation as claimed in any one of claims 26 to 30, wherein said first frequency band of electromagnetic radiation is in the ultraviolet frequencies and said second frequency band is in the green spectra frequencies and the source of electromagnetic radiation is the sun.

Claim 32 (withdrawn): A method for reducing the effects of a source of electromagnetic radiation as claimed in any one of claims 26 to 31, wherein at least of one said first and second frequency bands corresponds to the mm wavelength band.

Claim 33 (currently amended): An apparatus for controlling an attitude of a vehicle in a space having at least two opposed viewable regions about said vehicle, said apparatus including for viewing each region, a respective first sensor ~~for sensing~~ which senses radiation in a first frequency band of electromagnetic radiation and a respective second sensor ~~for sensing~~ which senses radiation in a second different frequency band of electromagnetic radiation, said apparatus further including:

a) respective first means for producing first data sets from said first sensors viewing each of said regions;

b) respective second means for producing second data sets from said second sensors viewing each of said regions;

c) respective third means for modifying each of said second data sets;

d) respective fourth means for combining the results of each of said third means with said first data sets to form respective third data sets for each of said regions; and

e) fifth means for generating a control signal to adjust the attitude of said vehicle until respective said third data sets for each opposed viewable region are substantially equal.

Claim 34 (previously presented): An apparatus for controlling an attitude of a vehicle as claimed in claim 33, wherein said respective third and fourth means act to reduce a bias introduced by a source of electromagnetic radiation in a viewable region.

Claim 35 (previously presented): An apparatus for controlling an attitude of a vehicle as claimed in claim 33, wherein measurements by each of said second sensors in said second frequency band are substantially sensitive to said electromagnetic source and relatively insensitive to intensity differences between the sky and ground in said second frequency band.

Claim 36 (currently amended): An apparatus as claimed in claim 33, wherein said respective third means multiply said second data set by a predetermined factor [[K]].

Claim 37 (previously presented): An apparatus for controlling an attitude of a vehicle as claimed in claim 33, wherein said respective fourth means subtracts the result of said third means from said first data set.

Claim 38 (previously presented): An apparatus for controlling an attitude of a vehicle as claimed in claim 33, further including:

f) sixth means for calculating an anti-correlation value for each of said respective third data sets, and

g) seventh means to reduce the effect of said control signal if said anti-correlation value is low.

Claim 39 (previously presented): An apparatus for controlling an attitude of a vehicle as claimed in claim 33, wherein said first frequency band of electromagnetic radiation is in the ultraviolet frequencies and said second frequency band is in the green spectra frequencies and the source of electromagnetic radiation is the sun.

Claim 40 (previously presented): An apparatus for controlling an attitude of a vehicle as claimed in claim 33, wherein at least of one said first and second frequency bands corresponds to the mm wavelength band.

Claim 41 (currently amended): An apparatus for calculating the attitude of a vehicle in a space having a viewable region, said apparatus including for viewing said region, a first and second pair of sensors, each of first and second pair including a first sensor ~~for sensing~~ which senses radiation in a first frequency band of electromagnetic radiation and a second sensor ~~for sensing~~ which senses radiation in a second different frequency band of electromagnetic radiation, said first pair of sensors adapted to be tilted a first predetermined angle to view a first sub-region substantially above and including a horizon between the ground and sky, and said second pair of sensors adapted to be tilted a second predetermined angle to view a second sub-region substantially below and including the horizon; said apparatus further including:

a) respective first means for producing respective first data sets from said first sensors of each pair;

b) respective second means producing second data sets from said second sensors of each first pair;

c) respective third means for modifying each of said second data sets;

d) respective fourth means for combining the results of each of said third means with said first data sets to form respective third data sets for each pair of sensors;

e) fifth means for determining a relationship between change in intensity between said third data sets and vehicle attitude; and

f) sixth means to calculate said vehicle attitude according to said relationship.

Claim 42 (previously presented): An apparatus for calculating the attitude of a vehicle as claimed in claim 41, wherein said sixth means further calculates the rate of change of vehicle attitude.

Claim 43 (previously presented): An apparatus for calculating the attitude of a vehicle as claimed in claim 41, wherein said respective third and fourth means act to reduce a bias introduced by a source of electromagnetic radiation in said viewable region.

Claim 44 (previously presented): An apparatus for calculating the attitude of a vehicle as claimed in claim 41, wherein measurements by each of said second sensors of each pair in said second frequency band are substantially sensitive to said electromagnetic source and relatively insensitive to intensity differences between the sky and ground in said second frequency band.

Claim 45 (original): An apparatus for calculating the attitude of a vehicle as claimed in claim 44, wherein the first band of electromagnetic radiation is in the ultraviolet frequencies and the second band is in the green spectra frequencies and the source of electromagnetic radiation is the sun

Claim 46 (original): An apparatus for calculating the attitude of a vehicle as claimed in claim 44, wherein at least of one said first and second frequency bands corresponds to the mm wavelength band.

Claim 47 (withdrawn): An apparatus for reducing the effects of a source of electromagnetic radiation when viewing a region to detect variations in background intensity in said region, said apparatus including:

a) first data capture means for producing a first data set from a first sensor viewing said region in a first frequency band;

b) second data capture means for producing a second data set from a second sensor viewing said region in said second frequency band;

c) first processor means for modifying said second data set;

d) second processor means for combining the result of said first data processor means with said first data set to form a third data set for said region, said third data set containing data wherein said effects of said electromagnetic source are substantially reduced relative to said variations in background intensity.

Claim 48 (withdrawn): An apparatus for reducing the effects of a source of electromagnetic radiation as claimed in claim 47, wherein measurements by said second sensors in said second frequency band are substantially sensitive to said electromagnetic source and relatively insensitive to intensity differences between variations in background intensity in said second frequency band.

Claim 49 (withdrawn): An apparatus for reducing the effects of a source of electromagnetic radiation as claimed in any one of claims 47 or 48, wherein said first processor means multiplies said second data set by a predetermined factor K.

Claim 50 (withdrawn): An apparatus for reducing the effects of a source of electromagnetic radiation as claimed in any one of claims 47 to 49, wherein said second processor means subtracts the result of said first processing means from said first data set.

Claim 51 (withdrawn): An apparatus for reducing the effects of a source of electromagnetic radiation as claimed in any one of claims 47 to 50, wherein said first frequency band of electromagnetic radiation is in the ultraviolet frequencies and said second frequency band is in the green spectra frequencies and the source of electromagnetic radiation is the sun.

Claim 52 (withdrawn): An apparatus for reducing the effects of a source of electromagnetic radiation as claimed in any one of claims 47 to 50, wherein at least of one said first and second frequency bands is in the mm band of frequencies.

Claim 53 (currently amended): A method for controlling an attitude of a vehicle said method including the steps of:

a) taking a first measurement of intensity of electromagnetic radiation in a first spectral band;

b) taking a second measurement of intensity of electromagnetic radiation in a second different spectral band;

c) processing ~~at least one of~~ said first and second measurements ~~with respect to each other~~ together; and

d) producing a control signal as a result of said processing step to control said attitude of said vehicle.

Claim 54 (currently amended): An apparatus for controlling an attitude of a vehicle, said apparatus including:

a) a first sensor for taking a first measurement of intensity of electromagnetic radiation in a first spectral band;

b) a second sensor for taking a second measurement of intensity of electromagnetic radiation in a second different spectral band;

c) a processor for processing said first and second measurements ~~with respect to each other~~ together; and

d) a control signal generator responsive to said processor for producing a control signal to control said attitude of said vehicle.

Claim 55 (new): A method for controlling the attitude of a vehicle as claimed in claim 53, wherein said processing includes filtering and multiplying to combine said first and second measurements.

Claim 56 (new): An apparatus for controlling an attitude of a vehicle as claimed in claim 54, wherein said processing includes filtering and multiplying to combine said first and second measurements.